

CLAIMS

1. A transmission method comprising:

a transmission method determining step of
5 determining any one of a first transmission method whereby
a transmission apparatus provided with a plurality of
antennas transmits a plurality of signals including the
same data from a plurality of antennas and a second
transmission method whereby the transmission apparatus
10 transmits a plurality of signals including different data
from the plurality of antennas;

a modulation scheme determining step of determining
any one of the plurality of modulation schemes; and

a control step of controlling whether or not
15 determining processing should be performed in said
transmission method determining step and said modulation
scheme determining step in accordance with a
communication procedure with the other communication
party.

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2. The transmission method according to claim 1, wherein
control is performed in said control step so that
determining processing is not carried out in said
transmission method determining step during data
25 transmission and determining processing is carried out
only in said modulation scheme determining step.

3. The transmission method according to claim 1, wherein the modulation scheme used for said first transmission method and the modulation scheme used for said second transmission method have the same maximum value of the
5 number of modulated M-ary index.

4. The transmission method according to claim 1, wherein in said transmission method determining step, said first transmission method or said second transmission method
10 are determined based on a channel fluctuation.

5. The transmission method according to claim 1, wherein a transmission method to be used at the start of a communication is predetermined in said transmission
15 method determining step and a modulation scheme to be used at the start of a communication is predetermined in said modulation scheme determining step.

6. The transmission method according to claim 1, wherein
20 control in said control step is performed in such a way that determining processing in said transmission method determining step is carried out at longer time intervals than determining processing carried out in said modulation scheme determining step.

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7. The transmission method according to claim 1, wherein cyclic delay diversity is used as said first transmission

method in said transmission method determining step.

8. The transmission method according to claim 1, wherein
an eigenmode in which singular vectors or eigen vectors
5 of a channel matrix in an MIMO system are used as channel
signature vectors is used as said first transmission
method in said transmission method determining step.

9. The transmission method according to claim 8, wherein
10 said first transmission method and said second
transmission method are switched in accordance with the
number of other communication parties in said
transmission method determining step.

15 10. A radio communication system comprising:

a transmission apparatus provided with a plurality
of antennas; and

a reception apparatus that receives signals
transmitted from the plurality of antennas of said
20 transmission apparatus,

said reception apparatus comprises:

a channel fluctuation estimation section that
estimates a channel fluctuation about signals transmitted
from the plurality of antennas of the transmission
25 apparatus;

a transmission method requesting section that
determines any one of a first transmission method of

transmitting a plurality of signals including the same data from the plurality of antennas and a second transmission method of transmitting a plurality of signals including different data from the plurality of antennas based on the estimated channel fluctuation and requests the determined transmission method from said transmission apparatus;

a modulation scheme requesting section that determines any one of a plurality of modulation schemes based on the estimated channel fluctuation and requests the determined modulation scheme from said transmission apparatus; and

a control section that controls whether or not the processing requested by said transmission method requesting section and modulation scheme requesting section should be performed in accordance with the procedure for a communication with said transmission apparatus, and

said transmission apparatus comprises:

a generation section that generates a signal corresponding to the transmission method requested from said reception apparatus; and

a transmission processing section that modulates a signal generated by said generation section according to the modulation scheme requested from said reception apparatus and transmits the modulated signal from the respective antennas.

11. A transmission apparatus comprising
a plurality of transmission antennas;
a transmission method determining section that
5 determines any one of a first transmission method of
transmitting a plurality of signals including the same
data from the plurality of antennas and a second
transmission method of transmitting a plurality of
signals including different data from the plurality of
10 antennas;
a modulation scheme determining section that
determines any one of a plurality of modulation schemes;
a control section that controls whether determining
processing by said transmission method determining
15 section and modulation scheme determining section should
be performed or not in accordance with the procedure for
a communication with the other communication party; and
a transmission processing section that transmits
the signals to which said determined transmission method
20 and modulation scheme are applied from said plurality
of antennas.

12. The transmission apparatus according to claim 11,
wherein said control section performs control in such
25 a way that the transmission method determining section
does not perform determining processing during data
transmission and only the modulation scheme determining

section performs determining processing.

13. The transmission apparatus according to claim 11,
wherein said transmission processing section adopts a
5 modulation scheme having the same maximum value of the
number of modulated M-ary index for the modulation scheme
used for said first transmission method and the modulation
scheme used for said second transmission method.

10 14. The transmission apparatus according to claim 11,
wherein said transmission method determining section
predetermines the transmission method to be used at the
start of a communication and said modulation scheme
determining section predetermines the modulation scheme
15 to be used at the start of a communication.

15. The transmission apparatus according to claim 11,
wherein said control section performs control in such
a way that said transmission method determining section
20 performs determining processing at longer time intervals
than said modulation scheme determining section performs
determining processing.

16. The transmission apparatus according to claim 11,
25 wherein said transmission method determining section uses
cyclic delay diversity as said first transmission method.

17. The transmission apparatus according to claim 11,
wherein said transmission method determining section uses
an eigenmode in which singular vectors or eigen vectors
of a channel matrix in an MIMO system are used as channel
5 signature vectors as said first transmission method.

18. The transmission apparatus according to claim 17,
wherein said transmission method determining section
switches between said first transmission method and said
10 second transmission method in accordance with the number
of other communication parties.

19. A reception apparatus comprising:

a transmission method determining section that
15 determines any one of a first transmission method of
transmitting a plurality of signals including the same
data from a plurality of antennas and a second transmission
method of transmitting a plurality of signals including
different data from the plurality of antennas;

20 a modulation scheme determining section that
determines any one of a plurality of modulation schemes;

a control section that controls whether the
determining processing by said transmission method
determining section and modulation scheme determining
25 section should be performed or not in accordance with
the procedure for a communication with the other
communication party; and

a requesting section that requests the determined transmission method and modulation scheme from the other communication party.

5 20. The reception apparatus according to claim 19, wherein said control section performs control in such a way that the transmission method determining section does not perform determining processing during data reception and only the modulation scheme determining section performs
10 determining processing.

21. The reception apparatus according to claim 19, further comprising a channel fluctuation estimation section that estimates both or any one of a channel fluctuation and
15 reception field intensity of the received signal, wherein said transmission method determining section determines the transmission method based on the estimation result estimated by said channel fluctuation estimation section.

20 22. The reception apparatus according to claim 19, wherein the modulation scheme used for said first transmission method and the modulation scheme used for said second transmission method adopt the same maximum value of the number of modulated M-ary index.